

**What is claimed is:**

1. A solid-state image pickup device comprising:
  - a photoelectric conversion section formed on the surface of a semiconductor substrate; and
- 5 a charge transfer section having a charge transfer electrode for transferring electric charges produced by the photoelectric conversion section,
  - wherein the charge transfer electrode of the charge transfer section comprises
- 10 a first electrode layer comprising a silicon conductive film formed on a gate oxide film formed on the surface of the semiconductor substrate;
- 15 a second electrode layer comprising a silicon conductive film formed on a gate oxide film between said first electrode layers;
- 20 a sidewall dielectric film formed on sidewalls of said first and second electrode layers; and
- a metal silicide film formed on the surfaces of said first and second electrode layers exposed from said sidewall dielectric film.

  

2. The solid-state image pickup device according to claim 1, wherein said second electrode layer is formed so as to sit astride and run on said first electrode layer via an interelectrode dielectric film from said gate oxide film.

3. The solid-state image pickup device according to claim 1, wherein said silicon conductive film is a doped polycrystalline silicon film.

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4. The solid-state image pickup device according to claim 1, wherein said silicon conductive film is a doped amorphous silicon film.

10 5. The solid-state image pickup device according to claim 1, wherein said metal silicide film is titanium silicide.

6. The solid-state image pickup device according to claim 1, wherein said metal silicide film is cobalt silicide.

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7. The solid-state image pickup device according to claim 1, wherein said metal silicide film is at least one of nickel silicide, palladium silicide, platinum silicide and tantalum silicide.

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8. A method for manufacturing a solid-state image pickup device comprising a photoelectric conversion section, and a charge transfer section having a charge transfer electrode for transferring electric charges produced by the photoelectric conversion section, the method comprising:

a process for forming, on the surface of the semiconductor substrate having the photoelectric conversion section formed thereon, a first electrode layer comprising a silicon conductive film via a gate oxide film and a second electrode layer comprising 5 a silicon conductive film via said gate oxide film existing between said first electrode layers;

a process for forming a dielectric film so as to cover the entirety of said semiconductor substrate;

a process for selectively removing said dielectric film 10 by means of anisotropic etching, to thereby form a sidewall dielectric film on sidewalls of said first and second electrode layers;

a process for forming a metallic film on top of said sidewall dielectric film;

15 a silicidation process for forming metal silicide on a boundary surface between said first and second electrode layers exposed from said sidewall dielectric film and said metal film, by means of heat treatment; and

a process for selectively removing a metal film which 20 has remained non-silicidated, thereby forming a charge transfer electrode comprising a silicon conductive film and a metal silicide film.

9. The method for manufacturing a solid-state image 25 pickup device according to claim 8, wherein said second electrode

layer is formed so as to sit astride and run on said first electrode layer via an interelectrode dielectric film from the top of said gate oxide film.

5        10. The method for manufacturing a solid-state image pickup device according to claim 8, wherein said process for forming said silicon conductive film includes a process for forming a polycrystalline silicon film and a process of doping said polycrystalline silicon film with dopants.

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11. The method for manufacturing a solid-state image pickup device according to claim 8, wherein said process for forming said silicon conductive film includes a process for forming an amorphous silicon film while dopants are being added.

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12. The method for manufacturing a solid-state image pickup device according to claim 8, further comprising a process for covering at least said photoelectric conversion section with a resist pattern prior to said anisotropic etching.

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13. The method for manufacturing a solid-state image pickup device according to claim 8, further comprising an annealing process for silicidating said metal silicide film that has not yet been subjected to heat treatment, wherein said 25 process for selectively removing said metal film is followed

by said annealing process.

14. The method for manufacturing a solid-state image pickup device according to claim 8, wherein said silicidation process is a process for heating in a nitrogen atmosphere from 690°C to 800°C.

15. The method for manufacturing a solid-state image pickup device according to claim 13, wherein said annealing process is a process for heating to a temperature of 800°C or higher.